

# PATENT ABSTRACTS OF JAPAN

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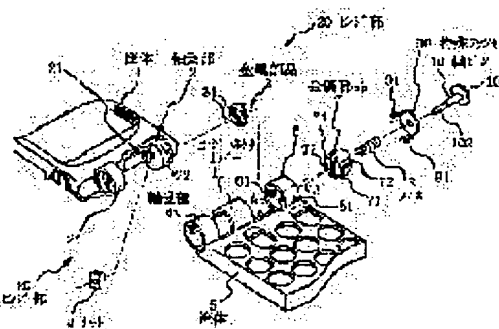
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## (54) HINGE PART STRUCTURE FOR PORTABLE TELEPHONE SET

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To surely stabilize the connection of a hinge part of a frame earth between housings especially at the time of turning the hinge part.

**SOLUTION:** The hinge part 20 is constituted of a bearing part 2 and a metallic part 3 to be mounted to the part 2, a metallic part 7 to be mounted to the bearing part 6, a spring 8, a special washer 90, a shaft pin 10 put through 7, 8 and 90, and a washer 4 screwed to the screw part of 10 for stopping pulling-out. The spring 91 of the special washer 9 is engaged with the groove 72 of the part 7 and the spring 91 slides inside of the part 6 by axial movement generated with turning. Each surface of the housings 1, 5 and the bearing parts 2 and 6 is conductively worked to make frame earth. Frame earth between the housings 1 and 5 is stably secured also at the time of turning by the pressure of the spring 91.



## CLAIMS

### [Claim(s)]

[Claim 1] Insert in an axial pin and a nut is screwed in the tip screw section of said axial pin. bearing of said 1st and 2nd cases of the portable telephone which consists of the 1st and 2nd cases which boils, respectively and is constructed two -- forming -- 1 of bearing of said 1st and 2nd cases -- constructing -- every -- While escaping, considering as a stop and enabling relative rotation of said 1st and 2nd cases, the contact side of said 1st case bearing and said 2nd case bearing is held in the pressure-welding condition. In the hinge region structure of preparing irregularity in the contact side and giving a predetermined click to rotation Hinge region structure of the portable telephone characterized by preparing metal flat spring in relative displacement of the shaft orientations generated with the irregularity prepared in said contact side with relative rotation of said 1st and 2nd cases at the sliding surface of opposite *Perilla frutescens* (L.) Britton var. *crispa* (Thunb.) Decne., and taking the flow of said 1st and 2nd frame grounds in a case.

[Claim 2] In the hinge region structure which makes rotatable and is combined said 1st and 2nd cases of the portable telephone which consists of the 1st and 2nd cases -- relativity -- The bearing of the cylindrical shape which is really formed in each of said 1st and 2nd cases, and is engaged mutually and which is constructed two, The 1st disc-like metal component which prepared heights in the front face in order to be inserted in the side which contacts the bearing of said 2nd case of the bearing of said 1st case and to give a predetermined click at the time of rotation, The 2nd metal component of the shape of a cylinder which prepared two slots which are inserted in the bearing side of said 1st case of the bearing of said 2nd case, and establish the crevice corresponding to the heights of said 1st metal component in this contact side in contact with said 1st metal component, and face along the wearing direction on a side face, The coiled form spring for pushing said 2nd metal component against said 1st metal component side by the fixed pressure, and holding a contact side in the pressure-welding condition, The special washer which has two tabular springs which engage with two slots of said 2nd metal component, and slide on the inside of said 2nd bearing by the fixed pressure at the time of rotation, The axial pin which inserts in said special washer and said spring, said 2nd metal component, said 1st metal component, and the bearing of said 1st case in this sequence, Hinge region structure of the portable telephone characterized by having the nut which screws in the tip screw section of said axial pin, and escapes from, and which is used as a stop, and performing electric conduction processing to all the front faces except the design side of said 1st and 2nd cases, and all the internal and external front faces of said bearing, and considering as a frame ground.

[Claim 3] Hinge region structure of the portable telephone according to claim 2 characterized by using the slot of said 2nd metal component as four slots which face, respectively, and making the tabular spring of said special washer into four.

[Claim 4] Claim 2 characterized by fixing the spring equivalent to the tabular spring of said special washer into the part of the slot of said 2nd metal component, and uniting said the 2nd metal components and said special washer with it, or hinge region structure of a portable telephone given in three.

## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

[0001]

[Field of the Invention] Especially this invention relates to the hinge region structure which ensures connection of the frame ground between the cases in a hinge region about the hinge region structure of a portable telephone.

[0002]

[Description of the Prior Art] The appearance of this kind of portable telephone is shown in drawing 3. Drawing 3 is the perspective view showing the appearance of the portable telephone of a general example. drawing 3 — setting — cases 1 and 5 — 2 sets of hinge regions 20 — relativity — it is combined rotatable. Each hinge region 20 is a case 5 and really [ the case 1 and really formed bearing 2 and ] formed. Bearing 6, Have the axial pin (not shown) inserted in the interior of the cylinder of bearings 2 and 5, and the device (not shown) prepared in the interior of the cylinder of bearing which holds the contact surface with bearings 2 and 5 in the pressure-welding condition, prepare irregularity in a contact side with bearings 2 and 5, and rotation is received. For example, the click fixed in the location opened at the time of the folded-up location and a message is given.

[0003] Moreover, circuit wiring which connects the circuit of cases 1 and 5 mutually is held in the interior of the hinge connector cover 11, and consists of connectors (not shown [ both ]) used for the connection the flexible printed circuit board by which foaming was carried out so that it might wind to a rotation shaft, and by the side of each case.

[0004]

[Problem(s) to be Solved by the Invention] Thus, although wiring whose conventional hinge region structure connects the circuit between cases electrically is prepared, there is a problem that a means to connect the frame ground between cases is not enough. That is, although electric conduction processing is carried out and each case is defending the shielding plate or the case inside to active jamming of an electromagnetic wave noise, in order to abolish the potential difference, it is desirable [ the connection between cases of this frame ground ] to make field connection. However, although field connection is made through the contact surface of bearing, i.e., the sliding surface at the time of rotation, an axial pin, etc. with the conventional hinge region structure, there is a problem that contact of this sliding section cannot hold to stability to sliding of the shaft orientations generated in order to give a click, when contact cannot hold to stability to sliding at the time of rotation, especially relative rotation of the case is carried out.

[0005]

[Means for Solving the Problem] The hinge region structure of the portable telephone of this invention Insert in an axial pin and a nut is screwed in the tip screw section of said axial pin. bearing of said 1st and 2nd cases of the portable telephone which consists of the 1st and 2nd cases which boils, respectively and is constructed two — forming — 1 of bearing of said 1st and 2nd cases — constructing — every — While escaping, considering as a stop and enabling relative rotation of said 1st and 2nd cases, the contact side of said 1st case bearing and said 2nd case bearing is held in the pressure-welding condition. In the hinge region structure of preparing irregularity in the contact side and giving a predetermined click to rotation Metal flat spring was prepared in relative displacement of the shaft orientations generated with the irregularity prepared in said contact side with relative rotation of said 1st and 2nd cases at the sliding surface of opposite *Perilla frutescens* (L.) Britton var. *crispa* (Thunb.) Decne., and the flow of said 1st and 2nd frame grounds in a case is taken.

[0006] In the hinge region structure which makes rotatable and is combined furthermore, said 1st and 2nd cases of the portable telephone which specifically consists of the 1st and 2nd cases — relativity — The bearing of the cylindrical shape which is really formed in each of said 1st and 2nd cases, and is engaged mutually and which is constructed two, The 1st disc-like metal component which prepared heights in the front face in order to be inserted in the side which contacts the bearing of said 2nd case of the bearing of said 1st case and to give a predetermined click at the time of rotation, The 2nd metal

component of the shape of a cylinder which prepared two slots which are inserted in the bearing side of said 1st case of the bearing of said 2nd case, and establish the crevice corresponding to the heights of said 1st metal component in this contact side in contact with said 1st metal component, and face along the wearing direction on a side face. The coiled form spring for pushing said 2nd metal component against said 1st metal component side by the fixed pressure, and holding a contact side in the pressure-welding condition. The special washer which has two tabular springs which engage with two slots of said 2nd metal component, and slide on the inside of said 2nd bearing by the fixed pressure at the time of rotation. The axial pin which inserts in said special washer and said spring, said 2nd metal component, said 1st metal component, and the bearing of said 1st case in this order. It has the nut which screws in the tip screw section of said axial pin, and escapes from and which is used as a stop, and electric conduction processing is performed to all the front faces except the design side of said 1st and 2nd cases, and all the internal and external front faces of said bearing, and it is considering as the shielding ground.

[0007] Moreover, it is possible to use the slot of said 2nd metal component as four slots which face, respectively, and to make the tabular spring of said special washer into four.

[0008] Moreover, the structure fixes the spring equivalent to the tabular spring of said special washer into the part of the side-face slot of said 2nd metal component, and it was made to unite said the 2nd metal components and said special washer with it is sufficient.

[0009]

[Embodiment of the Invention] Next, the gestalt of operation of this invention is explained with reference to a drawing. The appearance of the portable telephone of this invention is the same as that of the thing of the general example shown in drawing 3. Drawing 1 is the decomposition perspective view showing the hinge region structure of the example of a gestalt of operation of this invention. Drawing 2 is the sectional view of the A-A line in drawing 1.

[0010] as shown in drawing 3, this portable telephone consists of a case 1 and a case 5 -- having -- cases 1 and 5 -- the 2-set Mino hinge region 20 -- relatively -- it is combined rotatable. The hinge connector cover 11 is between the 2-set Mino hinge regions 20, and the flexible pudding plate and connector for interconnecting the circuit of cases 1 and 5 are held in the interior of this covering. As for all the front faces excluding [ cases 1 and 5 ] a design side and the bearings 2 and 6 of a hinge region 20, all the front faces by the side of inside and outside consist of bearings 2 and 6, the metal components 3 and 7, the spring 8, a special washer 9, an axial pin 10, and a nut 4 in drawing 1 which electric conduction processing of aluminum vacuum evaporation etc. was performed, and has obtained the shielding effect as a frame ground, as for the hinge region 20. Bearings 2 and 6 are really formed with cases 1 and 5, respectively, and are carrying out the cylindrical shape. It is inserted in the container liner of bearing 2, the concave section 22 and the rib 31 by the side of bearing 2 are engaged, and the metal components 3 are fixed to the rotation direction. The metal components 7 are inserted in the container liner of bearing 6, and contact the metal components 3. This metal component 7 slides to the path of insertion, while the rib 61 in a bearing 6 side is engaged and built into two slots 71 and is fixed to the rotation direction, when inserting in bearing 6. Moreover, the heights crevice is prepared and the contact side with the metal components 3 and 7 gives a predetermined click at the time of rotation, respectively.

[0011] A spring 8 pushes the metal components 7 against the metal components 3 side by the fixed pressure, and holds these both contact side in the pressure-welding condition. Although a special washer 9 has two tabular springs 91 and is inserted in the container liner of bearing 6 on both sides of a spring 8 among the metal components 7, at the time of this insertion, a spring 91 is engaged and built into the slot 72 of the metal components 7, and slides on the inside of bearing 6 by the fixed pressure to the path of insertion. The axial pin 10 inserts in each component part of a hinge region 20, as the chain line showed, it screws and escapes from a nut 4 in the tip screw section, and serves as a revolving shaft of a hinge region as a stop. In addition, a nut 4 is fixed to the rotation direction with the rib 21 of bearing 2.

[0012] In addition, two slots 72 of the metal components 7 are made into four, the spring 91 of the

corresponding special washer 9 is made into four, and you may make it stabilize sliding of the inside of bearing 6 more.

[0013] Moreover, a tabular spring may be directly welded to the front face of the metal components 7, and may be prepared in it, and the cost of materials may be reduced as structure of deleting a special washer 8.

[0014] Next, actuation is explained with reference to drawing 2. Drawing 2 is an A-A line sectional view shown in drawing 3 of a hinge region 20. Although bearings 2 and 6 carry out relative rotation, the metal components 3 and the axial pin 10 which were fixed in bearing 2 and the rotation direction rotate together. The metal components 7 and special washer 8 which were fixed in bearing 6 and the rotation direction on the other hand rotate together with this. Therefore, the field which slides in the rotation direction by relative rotation turns into a contact side (a-th page of illustration) of the metal components 3 and 7, a special washer 9, and the contact surface of the flange of the axial pin 10.

[0015] Moreover, the contact side a of the metal components 3 and 7 is held with a spring 8 at a pressure-welding condition, and only the dimension shown by the dotted line with the irregularity of a contact side moves in the direction of a lateral axis by relative rotation in it. The spring 91 of a special washer 9 slides on the inside of bearing 6 to migration of these shaft orientations.

[0016] Although a flow will be achieved by the sliding surface which mentioned above each inside and external surface of bearings 2 and 6 with the fixed contact surface of each component part since flow processing was performed if connection of the frame ground between the case 1 in a hinge region and 5 is seen here Especially, a stable flow is maintained by the pressure of a spring 8 to the sliding surface of the rotation direction at the time of relative rotation, and a stable flow is maintained by the pressure of the spring 91 of a special washer 9 to the sliding surface of the shaft orientations accompanying relative rotation.

[0017]

[Effect of the Invention] By the hinge structure of the portable telephone of this invention using a spring for the field on which it slides with rotation at the time of rotation of the hinge region which combines between the cases divided into two rotatable, especially the field on which it slides to rotation at shaft orientations, as explained above, since the fixed pressure was put and it is sliding, it is effective in connection of the frame ground between cases being stabilized through this sliding surface.

## DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] The decomposition perspective view showing the example of a gestalt of operation of this invention.

[Drawing 2] The A-A line sectional view in drawing 1

[Drawing 3] It is the perspective view showing the appearance of a general example.

[Description of Notations]

1 Five Case

2 Six Bearing

3 Seven Metal components

4 Nut

8 Spring

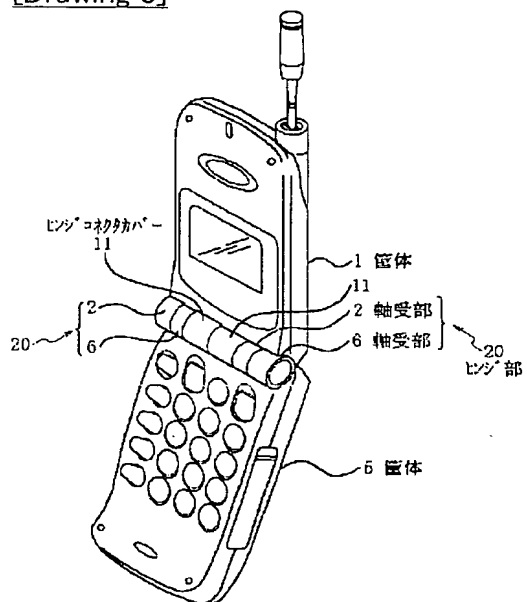
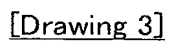
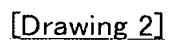
9 Special Washer

10 Axial Pin

11 Hinge Connector Cover

20 Hinge Region

[Drawing 1]



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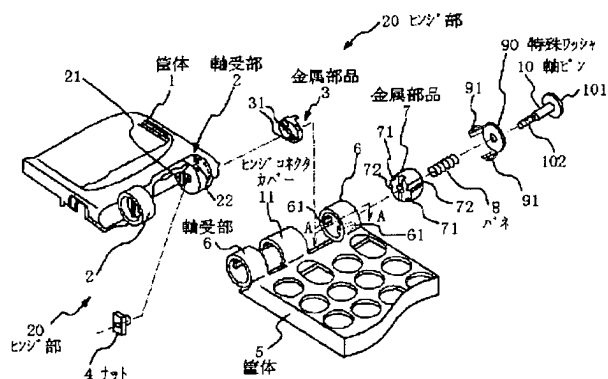
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(54)【発明の名称】 携帯電話機のヒンジ部構造

(57)【要約】

【課題】筐体間フレームアースのヒンジ部の接続を特にヒンジ部の回転時も確実に安定化する。

【解決手段】ヒンジ部20は軸受部2と、軸受部2に挿着される金属部品3と、軸受部6に挿着される金属部品7、バネ8、特殊ワッシャ9を軸ビン10で挿通しそのネジ部にワッシャ4を螺合して抜け止めとして構成される。金属部品7の溝72に特殊ワッシャ9のバネ91が係合し回転に伴って発生する軸方向の動きによりバネ91が軸受部6の内側を摺動する。筐体1、5および軸受部2、6の各表面は導電加工されフレームアースとなっている。筐体1、5間のフレームアースの接続はバネ91の圧力により回転時も安定に確保される。





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## 【特許請求の範囲】

【請求項 1】 第 1 及び第 2 の筐体から成る携帯電話機の前記第 1 及び第 2 の筐体のそれぞれに 2 組みの軸受部を形成し前記第 1 及び第 2 の筐体の軸受部の 1 組みずつに軸ピンを挿通し前記軸ピンの先端ネジ部にナットを螺合して抜け止めとし前記第 1 及び第 2 の筐体の相対回動を可能にすると共に前記第 1 の筐体軸受け部と前記第 2 の筐体軸受け部との当接面を圧接状態に保持し、その当接面に凹凸を設けて回動に対し所定のクリックを与えるヒンジ部構造において、前記第 1 および第 2 の筐体の相

10 対回動に伴い前記当接面に設けた凹凸により発生する軸方向の相対移動に対しその摺動面に金属製の板ばねを設け前記第 1 及び第 2 の筐体内フレームアースの導通をとることを特徴とする携帯電話機のヒンジ部構造。

【請求項 2】 第 1 及び第 2 の筐体から成る携帯電話機の前記第 1 及び第 2 の筐体を相対回動可能にして結合するヒンジ部構造において、前記第 1 及び第 2 の筐体のそれぞれに一体形成され相互に係合する 2 組みの円筒形の軸受け部と、前記第 1 の筐体の軸受け部の前記第 2 の筐体の軸受け部と当接する側に挿着され回動時に所定のク

20 リックを与えるために表面に凸部を設けた円盤状の第 1 の金属部品と、前記第 2 の筐体の軸受け部の前記第 1 の筐体の軸受け部側に挿着され前記第 1 の金属部品と当接しこの当接面に前記第 1 の金属部品の凸部に対応する凹部を設けかつ側面上の装着方向に沿って相対する 2 本の溝を設けた円筒状の第 2 の金属部品と、前記第 2 の金属部品を前記第 1 の金属部品側へ一定の圧力で押し付け当接面を圧接状態に保持するためのコイル状のバネと、前記第 2 の金属部品の 2 本の溝に係合し回動時に前記第 2

30 の軸受け部の内面を一定の圧力で摺動する 2 本の板状のバネを有する特殊ワッシャーと、前記特殊ワッシャーと前記バネと前記第 2 の金属部品と前記第 1 の金属部品と前記第 1 の筐体の軸受け部とをこの順序で挿通する軸ピンと、前記軸ピンの先端ネジ部に螺合し抜け止めとするナットとを備え、かつ前記第 1 及び第 2 の筐体の意匠面を除く全表面および前記軸受け部の内外の全表面に導電加工を施しフレームアースとすることを特徴とする携帯電話機のヒンジ部構造。

## 【発明の詳細な説明】

【0001】

【発明の属する技術分野】 本発明は携帯電話機のヒンジ

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部構造に関し、特にヒンジ部における筐体間のフレームアースの接続を確実にするヒンジ部構造に関する。

【0002】

【従来の技術】 この種の携帯電話機の外観を図 3 に示す。図 3 は一般例の携帯電話機の外観を示す斜視図である。図 3 において、筐体 1 と 5 とは 2 組のヒンジ部 20 で相対回動可能に結合されている。各ヒンジ部 20 は筐体 1 と一体形成された軸受部 2 と、筐体 5 と一体形成され軸受部 6 と、軸受部 2 と 5 の円筒内部に挿通された軸ピン（図示せず）と、軸受部 2 と 5 との接触面を圧接状態に保持する軸受部の円筒内部に設けられた機構（図示せず）とを備え、軸受部 2 と 5 との当接面に凹凸を設けて回動に対して、例えば折り畳んだ位置および通話時の開いた位置で固定するクリックを与えるようになっている。

【0003】 また、筐体 1、5 の回路を相互に接続する回路配線はヒンジコネクタカバー 11 の内部に收容されており、回動軸に対し捲回するようにフォーミングされたフレキシブルプリント板と各筐体側との接続に用いるコネクタ（共に図示せず）とで構成されている。

【0004】

【発明が解決しようとする課題】 このように従来のヒンジ部構造は、筐体間の回路を電氣的に接続する配線は設けられているが、筐体間のフレームアースを接続する手段が充分でないという問題がある。即ち、各筐体は電磁波ノイズの妨害に対してシールド板あるいは筐体内面を導電加工するなどして防御しているが、このフレームアースの筐体間接続は電位差を無くすために面接触することが望ましい。しかし従来のヒンジ部構造では軸受部の接触面、即ち回動時の摺動面あるいは軸ピンなどを介し面接触されるが、回動時の摺動に対し接触が安定に保持できず、特に筐体を相対回動する時にクリックを与えるため発生する軸方向の摺動に対しこの摺動部の接触が安定に保持できないという問題がある。

【0005】

【課題を解決するための手段】 本発明の携帯電話機のヒンジ部構造は、第 1 及び第 2 の筐体から成る携帯電話機の前記第 1 及び第 2 の筐体のそれぞれに 2 組みの軸受部を形成し前記第 1 及び第 2 の筐体の軸受部の 1 組みずつに軸ピンを挿通し前記軸ピンの先端ネジ部にナットを螺合して抜け止めとし前記第 1 及び第 2 の筐体の相対回動を可能にすると共に前記第 1 の筐体軸受け部と前記第 2 の筐体軸受け部との当接面を圧接状態に保持し、その当接面に凹凸を設けて回動に対し所定のクリックを与えるヒンジ部構造において、前記第 1 および第 2 の筐体の相対回動に伴い前記当接面に設けた凹凸により発生する軸方向の相対移動に対しその摺動面に金属製の板ばねを設け前記第 1 及び第 2 の筐体内フレームアースの導通をとっている。

【0006】 更に具体的には、第 1 及び第 2 の筐体から

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成る携帯電話機の前記第 1 及び第 2 の筐体を相対回動可能にして結合するヒンジ部構造において、前記第 1 及び第 2 の筐体のそれぞれに一体形成され相互に係合する 2 組みの円筒形の軸受け部と、前記第 1 の筐体の軸受け部の前記第 2 の筐体の軸受け部と当接する側に挿着され回転時に所定のクリックを与えるために表面に凸部を設けた円盤状の第 1 の金属部品と、前記第 2 の筐体の軸受け部の前記第 1 の筐体の軸受け部側に挿着され前記第 1 の金属部品と当接しこの当接面に前記第 1 の金属部品の凸部に対応する凹部を設けかつ側面上の装着方向に沿って相対する 2 本の溝を設けた円筒状の第 2 の金属部品と、前記第 2 の金属部品を前記第 1 の金属部品側へ一定の圧力で押し付け当接面を圧接状態に保持するためのコイル状のバネと、前記第 2 の金属部品の 2 本の溝に係合し回転時に前記第 2 の軸受け部の内面を一定の圧力で摺動する 2 本の板状のバネを有する特殊ワッシャーと、前記特殊ワッシャーと前記バネと前記第 2 の金属部品と前記第 1 の金属部品と前記第 1 の筐体の軸受け部とをこの順で挿通する軸ピンと、前記軸ピンの先端ネジ部に螺合し抜け止めとするナットとを備え、かつ前記第 1 及び第 2 の筐体の意匠面を除く全表面および前記軸受け部の内外の全表面に導電加工を施しシールドアースとしている。

【0007】また、前記第 2 の金属部品の溝をそれぞれ相対する 4 本の溝とし、前記特殊ワッシャーの板状のバネを 4 本とすることでも良い。

【0008】また、前記第 2 の金属部品の側面溝の部分に前記特殊ワッシャーの板状のバネに相当するバネを固着し前記第 2 の金属部品と前記特殊ワッシャーとを一体化するようにした構造でも良い。

【0009】

【発明の実施の形態】次に本発明の実施の形態について図面を参照して説明する。本発明の携帯電話機の外観は図 3 に示す一般例のものと同一である。図 1 は本発明の実施の形態例のヒンジ部構造を示す分解斜視図である。図 2 は図 1 における A-A 線の断面図である。

【0010】図 3 に示すように本携帯電話機は筐体 1 と筐体 5 とから構成され、筐体 1、5 は 2 組みのヒンジ部 20 により相対回動可能に結合されている。2 組みのヒンジ部 20 の間にはヒンジコネクタカバー 11 があり、このカバー内部には筐体 1、5 の回路を相互接続するためのフレキシブルプリント板とコネクタとが収容されている。筐体 1、5 は意匠面をのぞく全表面、またヒンジ部 20 の軸受部 2、6 は内外側の全表面がアルミ蒸着などの導電加工が施され、フレームアースとしてシールド効果を得ている図 1 において、ヒンジ部 20 は軸受部 2、6、金属部品 3、7、バネ 8、特殊ワッシャー 9、軸ピン 10 およびナット 4 とで構成されている。軸受部 2、6 は筐体 1、5 とそれぞれ一体形成され円筒形をしている。金属部品 3 は軸受部 2 の内筒に挿着され、軸受部 2 側の凹溝部 22 とリブ 31 とが係合し回転方向に対し固

定される。金属部品 7 は軸受部 6 の内筒に挿着され金属部品 3 と当接する。この金属部品 7 は軸受部 6 に挿入する時に軸受部 6 側にあるリブ 61 が 2 本の溝 71 に係合して組み込まれ回転方向に対し固定されると同時に挿入方向に対し摺動するようになっている。また金属部品 3 と 7 との当接面はそれぞれ凸部凹部が設けられており回転時に所定のクリックを与えるようになっている。

【0011】バネ 8 は金属部品 7 を一定の圧力で金属部品 3 側へ押し付けるもので、この両者の当接面を圧接状態に保持する。特殊ワッシャー 9 は 2 本の板状のバネ 91 を有し、金属部品 7 との間にバネ 8 を挟み軸受部 6 の内筒へ挿着されるが、この挿入時にバネ 91 は金属部品 7 の溝 72 に係合し組み込まれ、挿入方向に対し軸受部 6 の内面を一定の圧力で摺動する。軸ピン 10 は鎖線で示したようにヒンジ部 20 の各構成部品を挿通し、先端ネジ部にナット 4 を螺合し抜け止めとしてヒンジ部の回転軸となる。尚、ナット 4 は軸受部 2 のリブ 21 により回転方向に対し固定される。

【0012】尚、金属部品 7 の 2 本の溝 72 を 4 本とし、対応する特殊ワッシャー 9 のバネ 91 を 4 本として軸受部 6 の内面の摺動をより安定化するようにしても良い。

【0013】また、金属部品 7 の表面に板状のバネを直接溶接して設け、特殊ワッシャー 8 を削除する構造として材料費を節減しても良い。

【0014】次に図 2 を参照して動作を説明する。図 2 はヒンジ部 20 の図 3 に示す A-A 線断面図である。軸受部 2、6 は相対回動するが、軸受部 2 と回転方向に固定された金属部品 3 および軸ピン 10 は一緒に回転する。一方軸受部 6 と回転方向に固定された金属部品 7 および特殊ワッシャー 8 はこれと一緒に回転する。従って相対回動により回転方向に摺動する面は金属部品 3、7 の当接面（図示の a 面）と特殊ワッシャー 9 と軸ピン 10 のフランジの接触面となる。

【0015】また、金属部品 3、7 の当接面 a はバネ 8 により圧接状態に保持され、相対回動により当接面の凹凸により点線で示した寸法だけ左右軸方向に移動する。この軸方向の移動に対して特殊ワッシャー 9 のバネ 91 が軸受部 6 の内側を摺動する。

【0016】ここでヒンジ部における筐体 1、5 間のフレームアースの接続を見ると、軸受部 2、6 の各内面・外面は導通加工が施されているので、各構成部品の固定接触面と前述した摺動面とで導通が図られるが、特に相対回動時の回転方向の摺動面に対してはバネ 8 の圧力により安定な導通が保たれ、また、相対回動に伴う軸方向の摺動面に対しては特殊ワッシャー 9 のバネ 91 の圧力により安定な導通が保たれるようになっている。

【0017】

【発明の効果】以上説明したように本発明の携帯電話機のヒンジ構造は、2 分割された筐体間を回動可能に結合

するヒンジ部の回転時において、回転に伴って摺動する面、特に回転に対して軸方向に摺動する面にバネを用いて一定の圧力をかけ摺動しているので、この摺動面を介して筐体間フレームアースの接続が安定化されるという効果がある。

【図面の簡単な説明】

【図 1】 本発明の実施の形態例を示す分解斜視図。

【図 2】 図 1 における A-A 線断面図

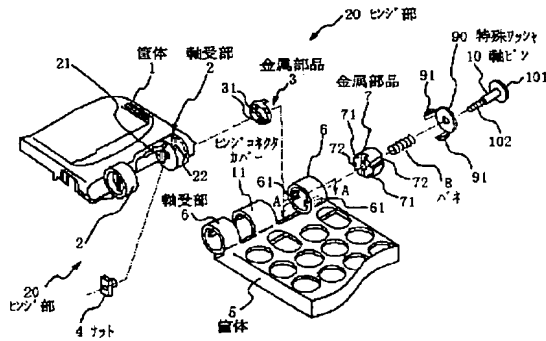
【図 3】 一般例の外観を示す斜視図である。

【符号の説明】

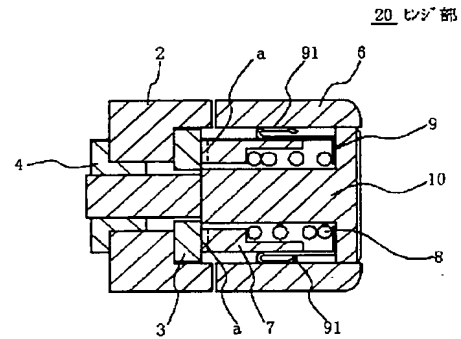
\*10

- \* 1, 5 筐体
- 2, 6 軸受部
- 3, 7 金属部品
- 4 ナット
- 8 バネ
- 9 特殊ワッシャ
- 10 軸ピン
- 11 ヒンジコネクタカバー
- 20 ヒンジ部

【図 1】

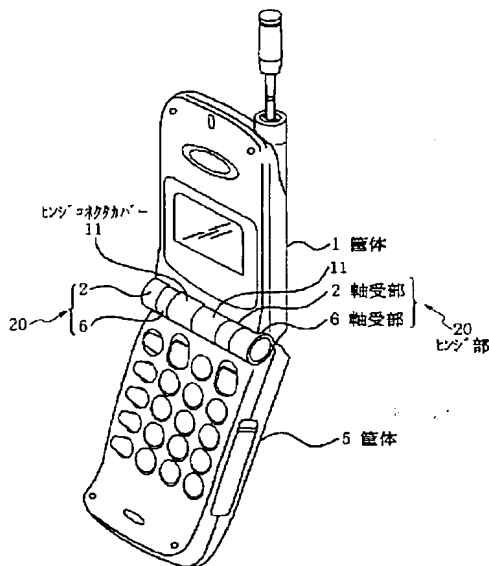


【図 2】



A-A線断面図

【図 3】



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